Service Manual

Pioneer

ORDER NO.
ARP3027

EGSS ENCODER
BE-3110

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	BE-3110		
KUW	◯	AC120V	————

P.C.BOARD ASSEMBLIES

P.C.Board Assembly	Part No.	Serial No.	Part No.	Serial No.
RF ASSEMBLY	BZW1310	~ QG3701780	BZW1491	QG3701781 ~
DISPLAY ASSEMBLY	BZW1312	~ QG3701780	BZW1490	QG3701781 ~
DISPLAY INTERFACE ASSEMBLY	BZW1319	~ QG3701780	Not used	QG3701781 ~
LOGIC ASSEMBLY	BWZ1311	~ QG3701780	BZW1489	QG3701781 ~

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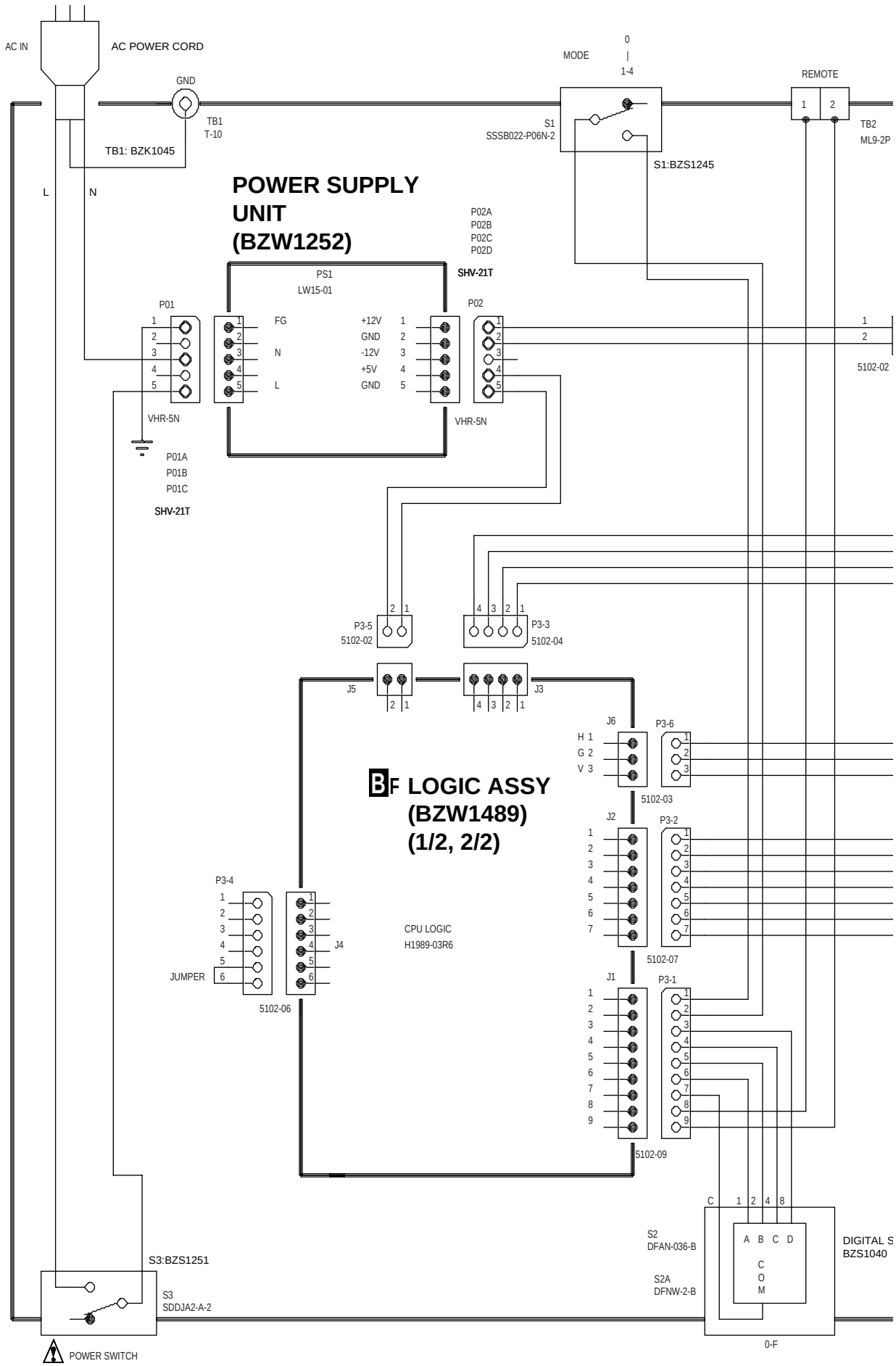
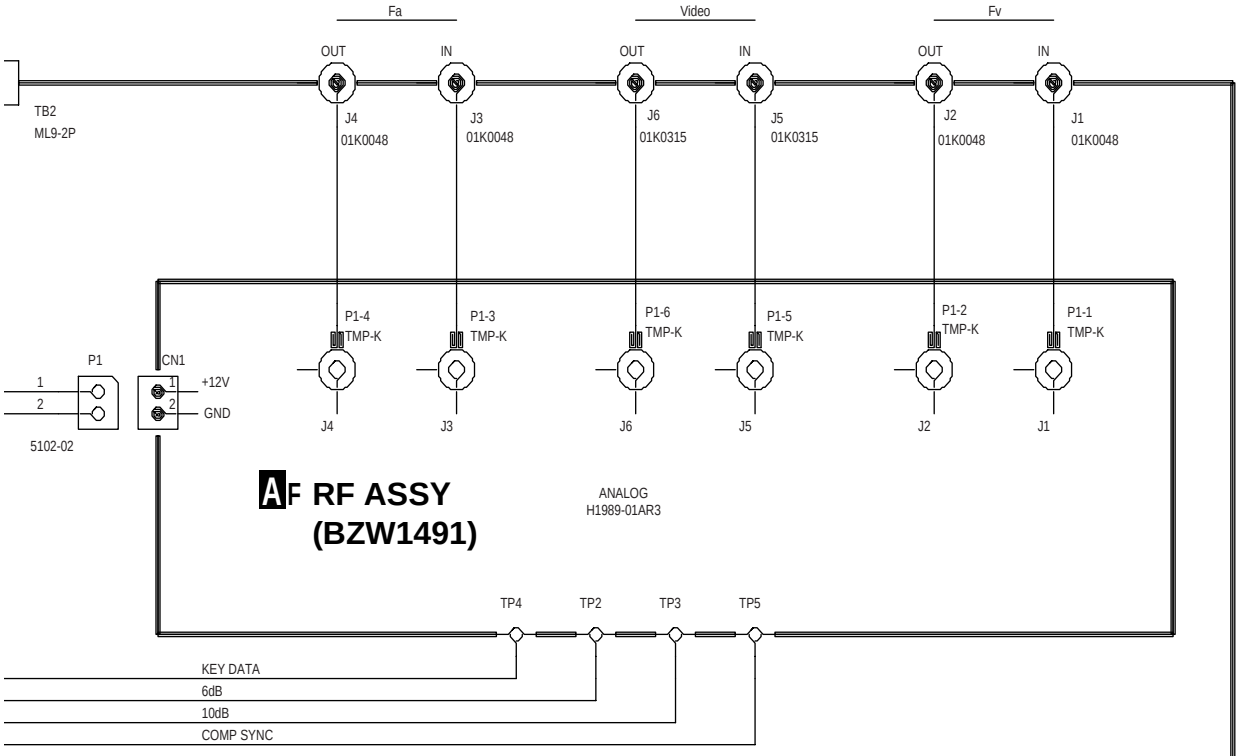
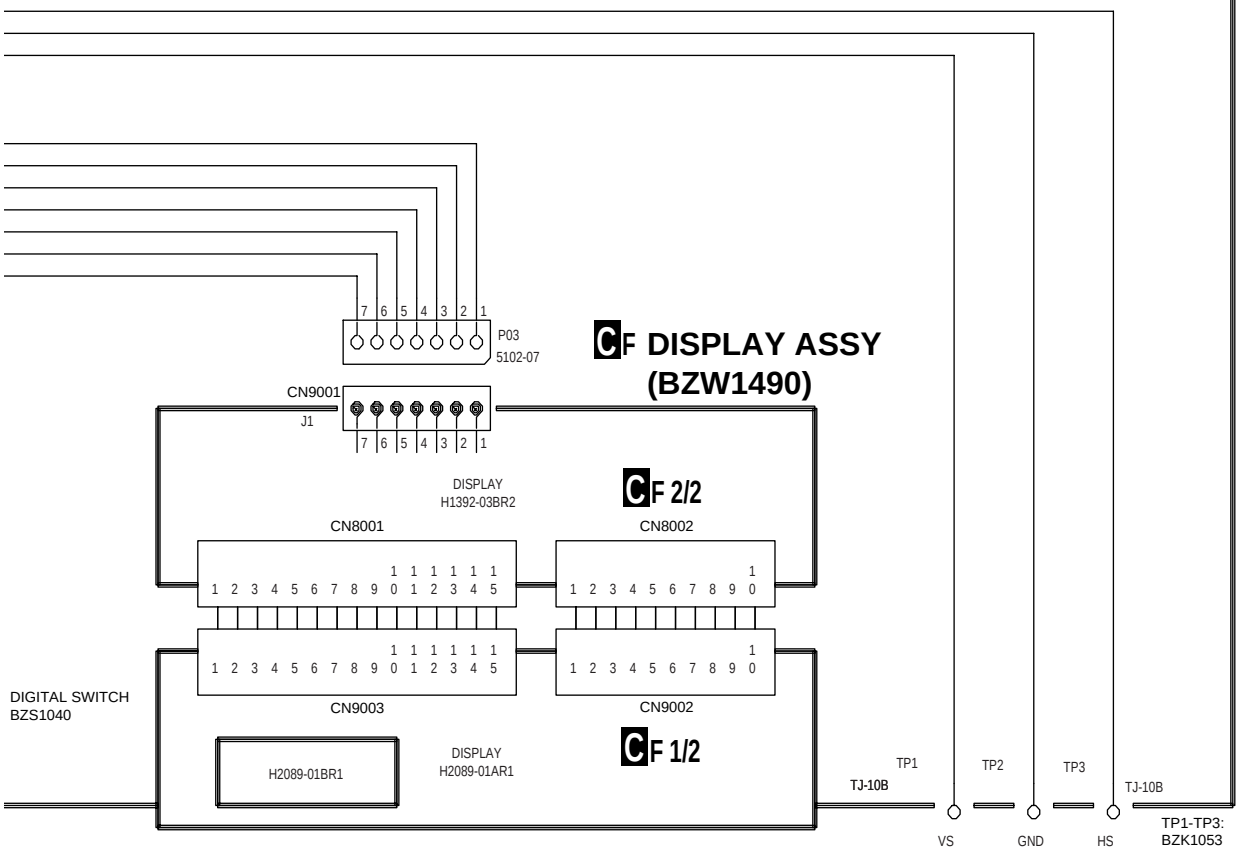
1. SCHEMATIC DIAGRAM

1.1 OVERALL CONNECTION DIAGRAM

Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST"

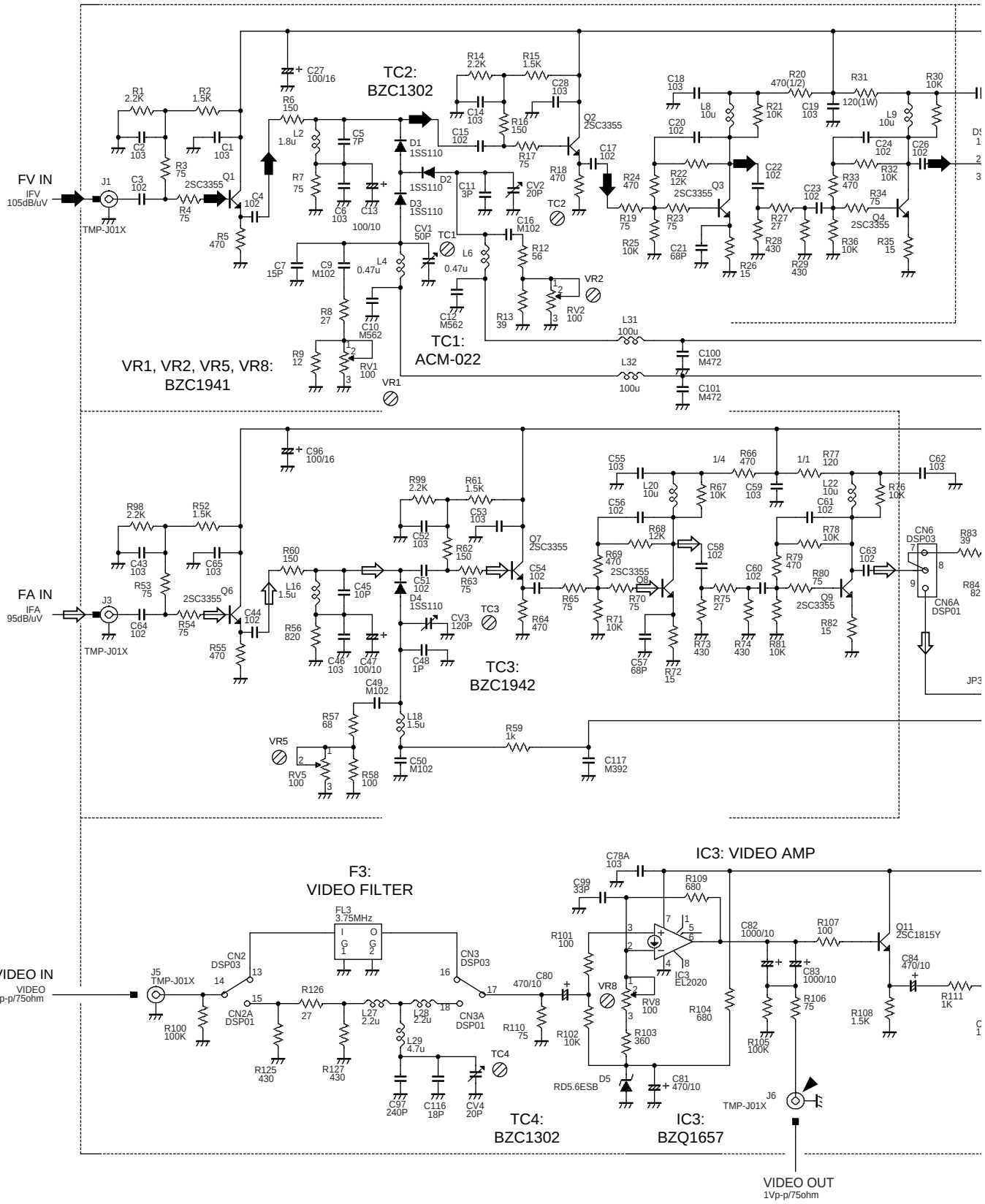


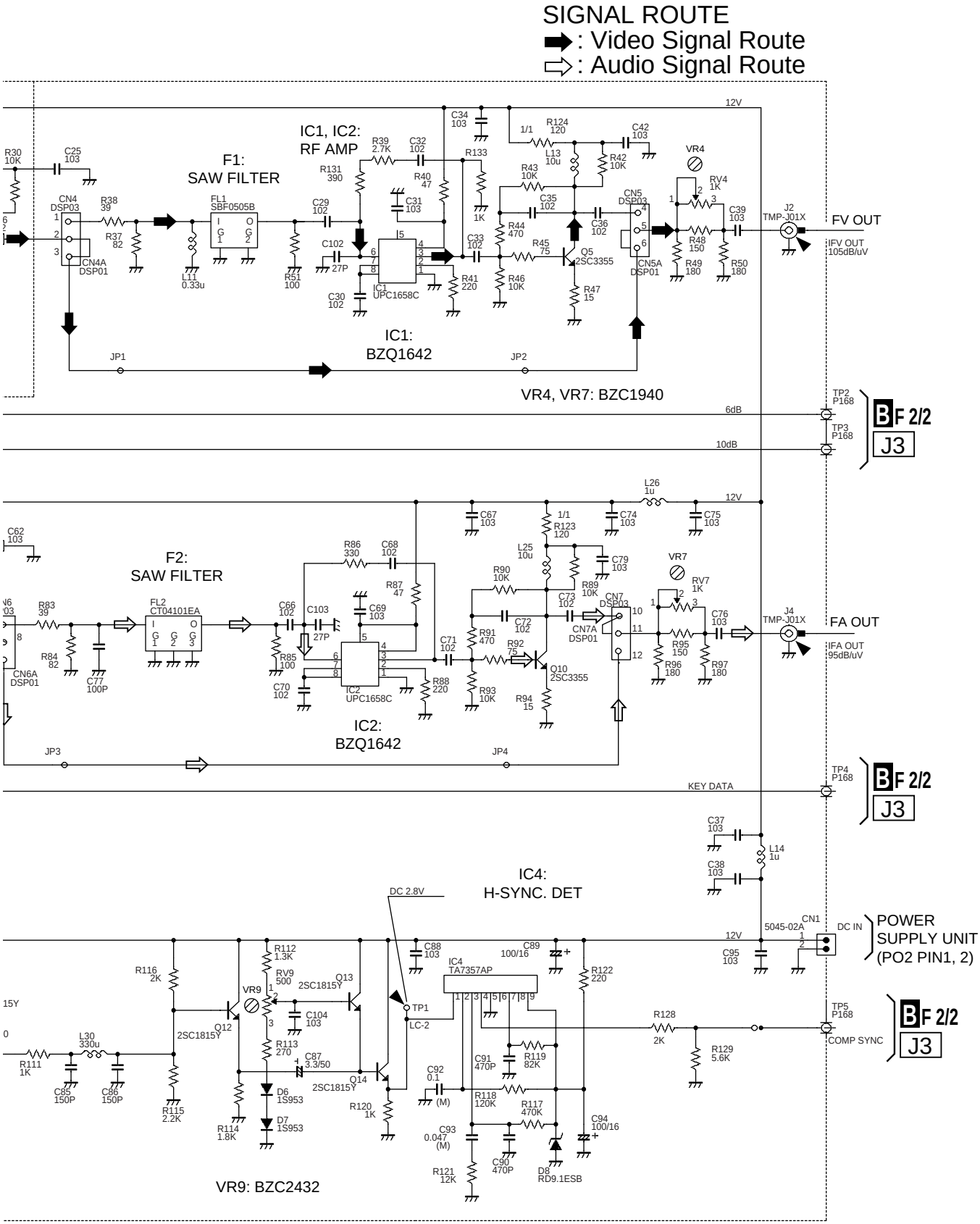

Fa
Video
Fv
OUT
IN
TB2
ML9-2P
J4
01K0048
J3
01K0048
J6
01K0315
J5
01K0315
J2
01K0048
J1
01K0048
P1-4
TMP-K
P1-3
TMP-K
P1-6
TMP-K
P1-5
TMP-K
P1-2
TMP-K
P1-1
TMP-K
P1
CN1
+12V
GND
5102-02
AF RF ASSY
(BZW1491)
ANALOG
H1989-01AR3
TP4
TP2
TP3
TP5
KEY DATA
6dB
10dB
COMP SYNC


P03
5102-07
CF DISPLAY ASSY
(BZW1490)
CN9001
J1
DISPLAY
H1392-03BR2
CF 2/2
CN8001
CN8002
CN9003
CN9002
DIGITAL SWITCH
BZS1040
H2089-01BR1
DISPLAY
H2089-01AR1
CF 1/2
TP1
TP2
TP3
TJ-10B
TJ-10B
VS
GND
HS
TP1-TP3:
BZK1053

1.2 RF ASSY

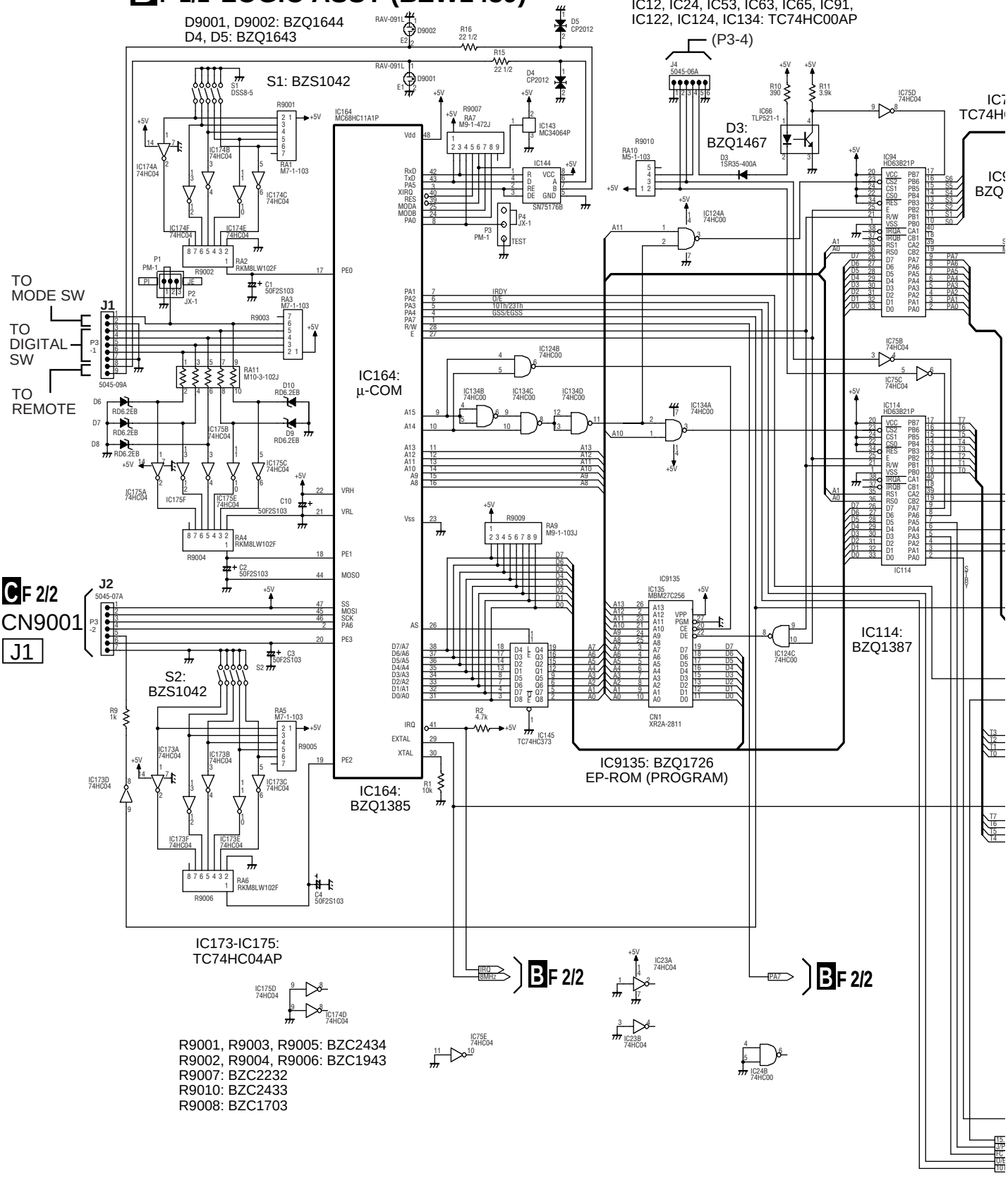
RF ASSY (BZW1491)

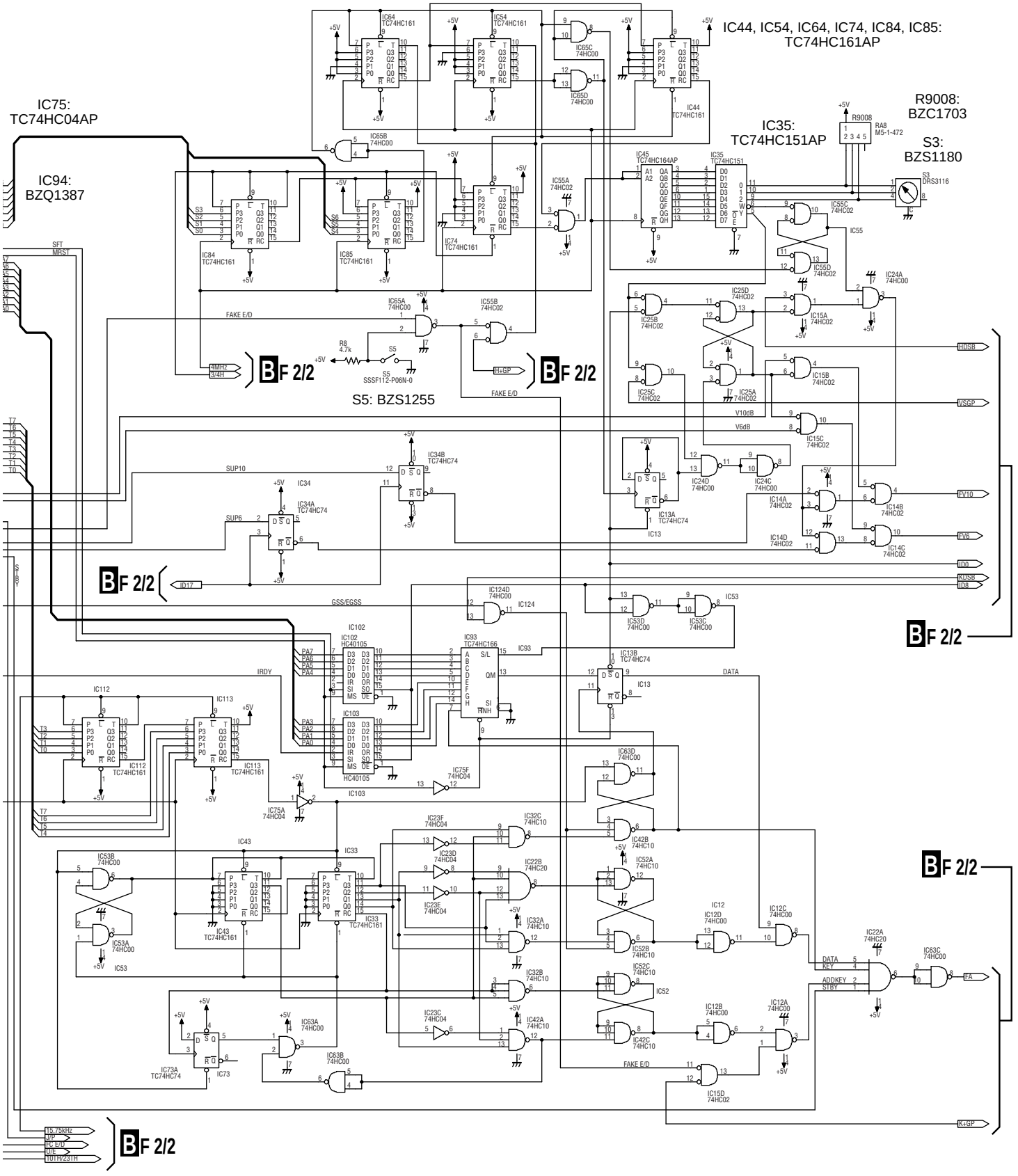



SIGNAL ROUTE
: Video Signal Route
: Audio Signal Route
IC1, IC2:
RF AMP
F1:
SAW FILTER
IC1:
BZQ1642
VR4, VR7: BZC1940
FV OUT
IFV OUT
105dB/uV
6dB
10dB
TP2
P168
TP3
P168
BF 2/2
J3
F2:
SAW FILTER
IC2:
BZQ1642
FA OUT
IFA OUT
95dB/uV
KEY DATA
TP4
P168
IC4:
H-SYNC. DET
DC 2.8V
POWER
SUPPLY UNIT
(PO2 PIN1, 2)
DC IN
5045-02A
CN1
TP5
P168
COMP SYNC
VR9: BZC2432
12V
JP1
JP2
JP3
JP4

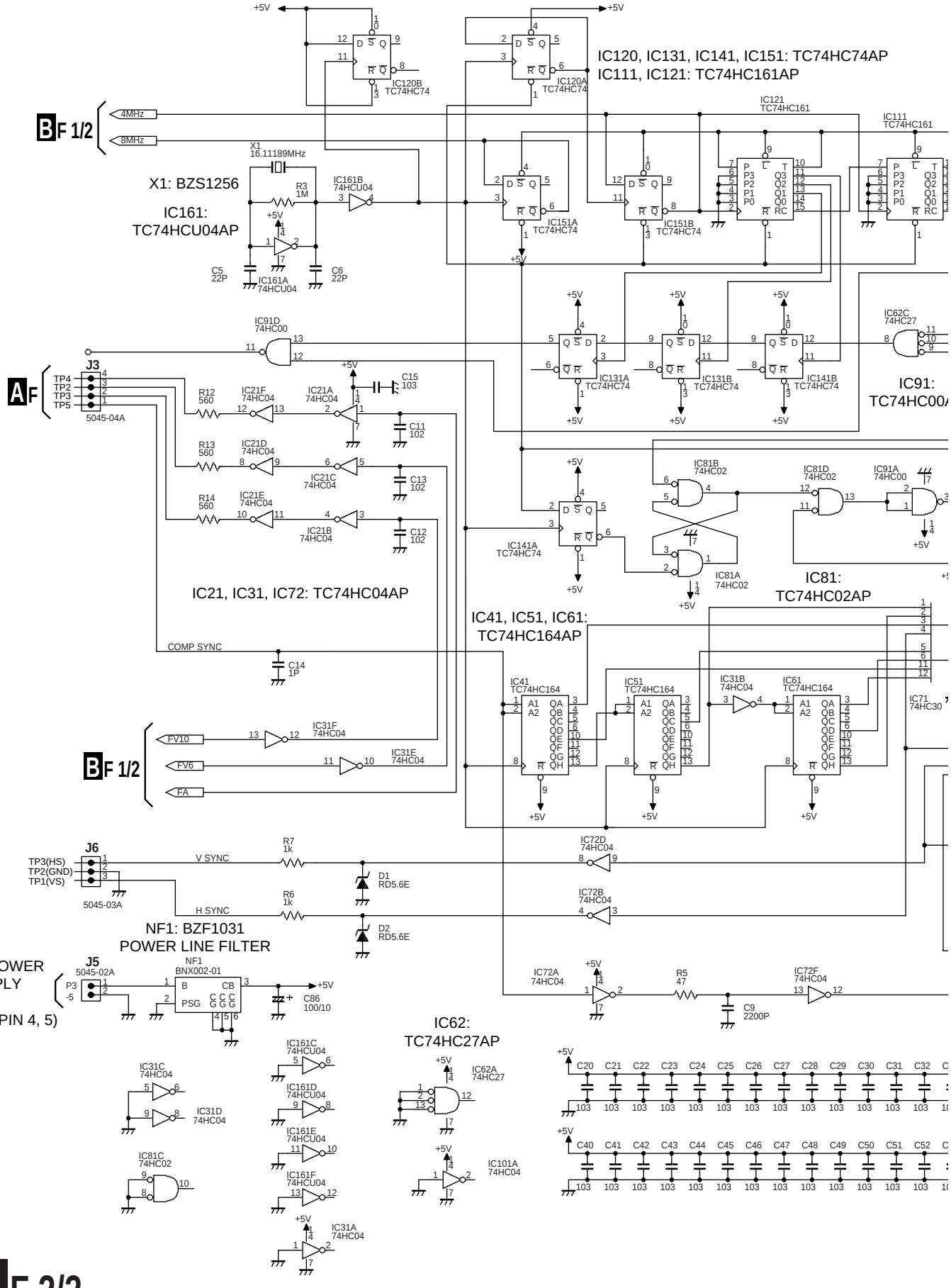
1.3 LOGIC ASSY (1/2)

BF 1/2 LOGIC ASSY (BZW1489)

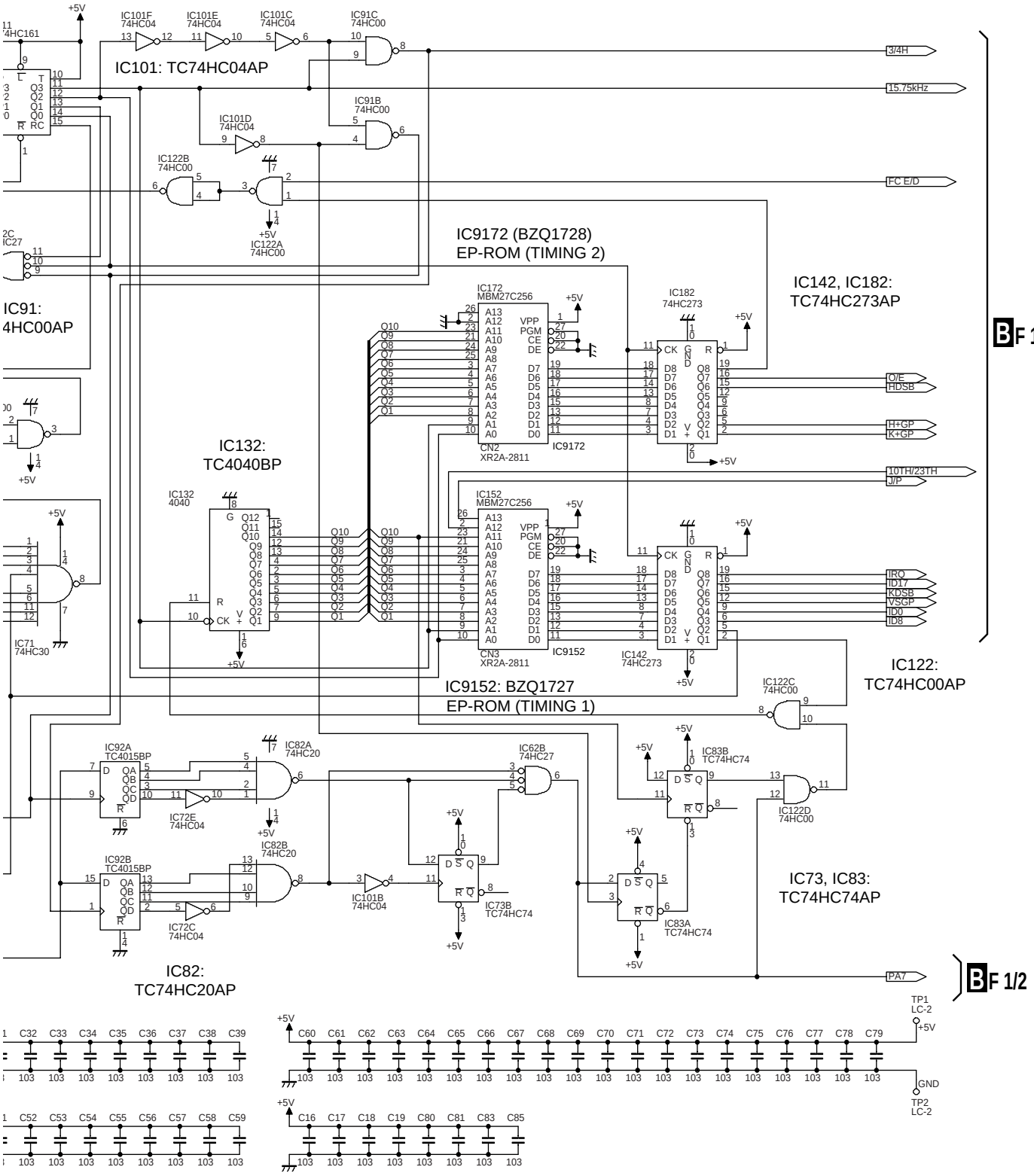



IC44, IC54, IC64, IC74, IC84, IC85:
TC74HC161AP
IC75:
TC74HC04AP
IC94:
BZQ1387
IC35:
TC74HC151AP
R9008:
BZC1703
S3:
BZS1180
S5: BZS1255
BF 2/2
BF 1/2
FAKE E/D
SFT
MRST
IRDY
DATA
GSS/EGSS
SUP10
SUP6
V10dB
V6dB
HDSB
VSGP
FV10
FV6
ID0
KOSB
ID8
K+GP
FA
4MHz
3/4H
15.75kHz
H+GP

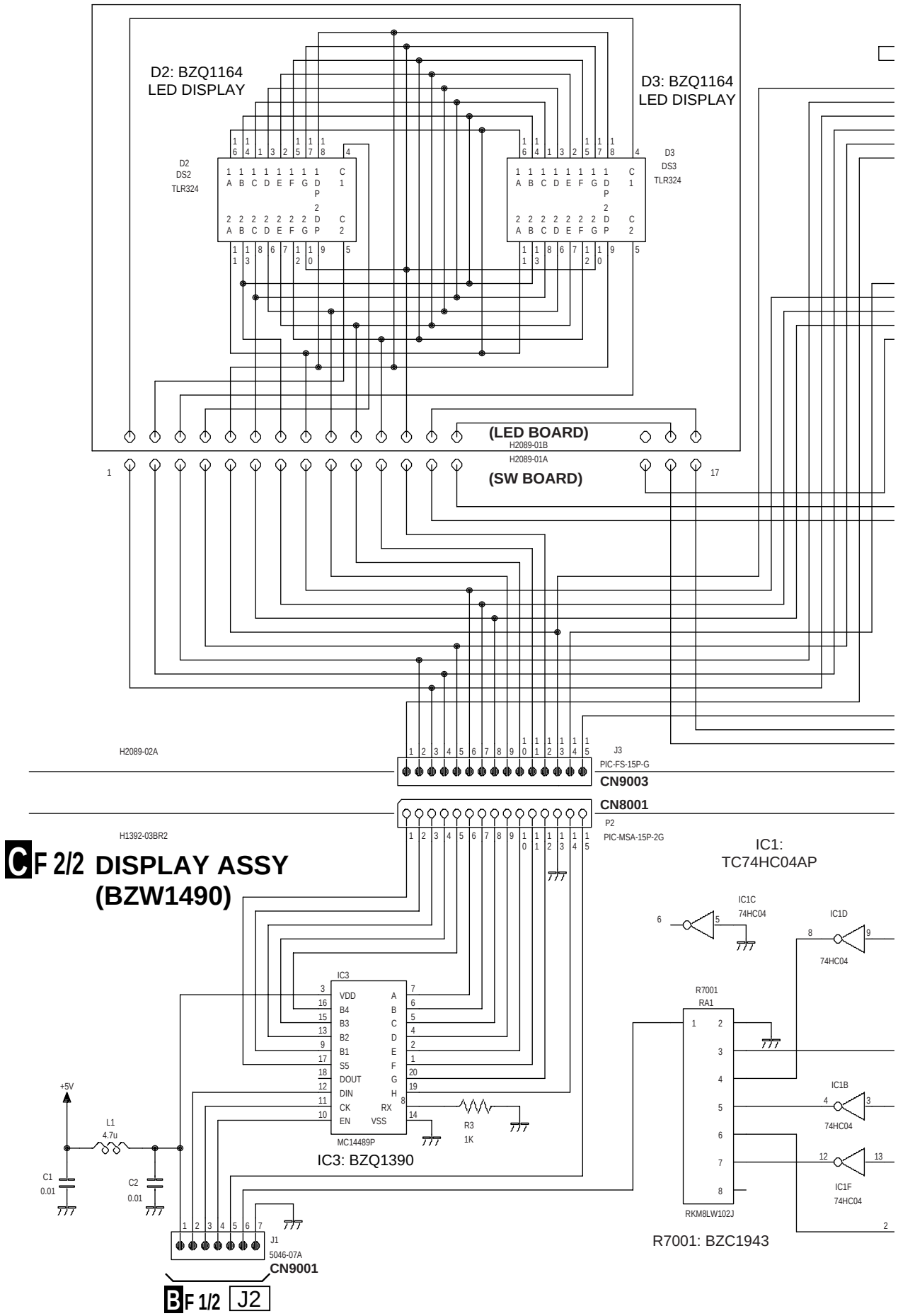
1.4 LOGIC ASSY (2/2)



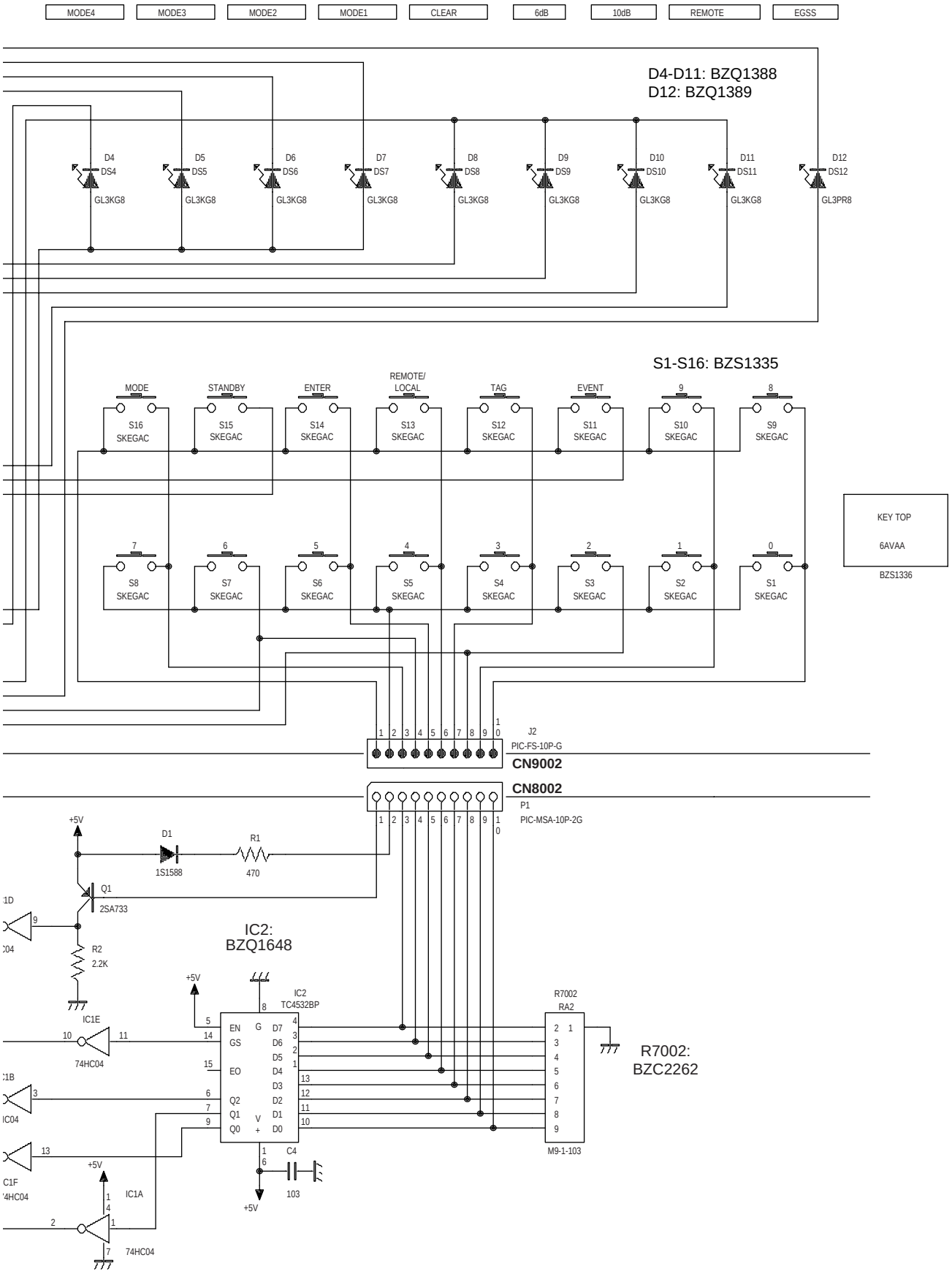
BF 2/2 LOGIC ASSY (BZW1489)



1.5 DISPLAY ASSY



CF 1/2 DISPLAY ASSY (BZW1490)

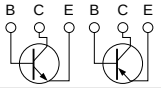
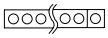
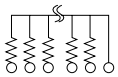


2. PCB CONNECTION DIAGRAM

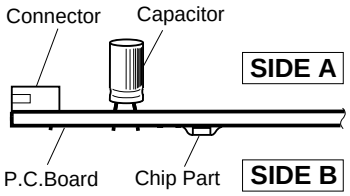
2.1 RF ASSY

NOTE FOR PCB DIAGRAMS :

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

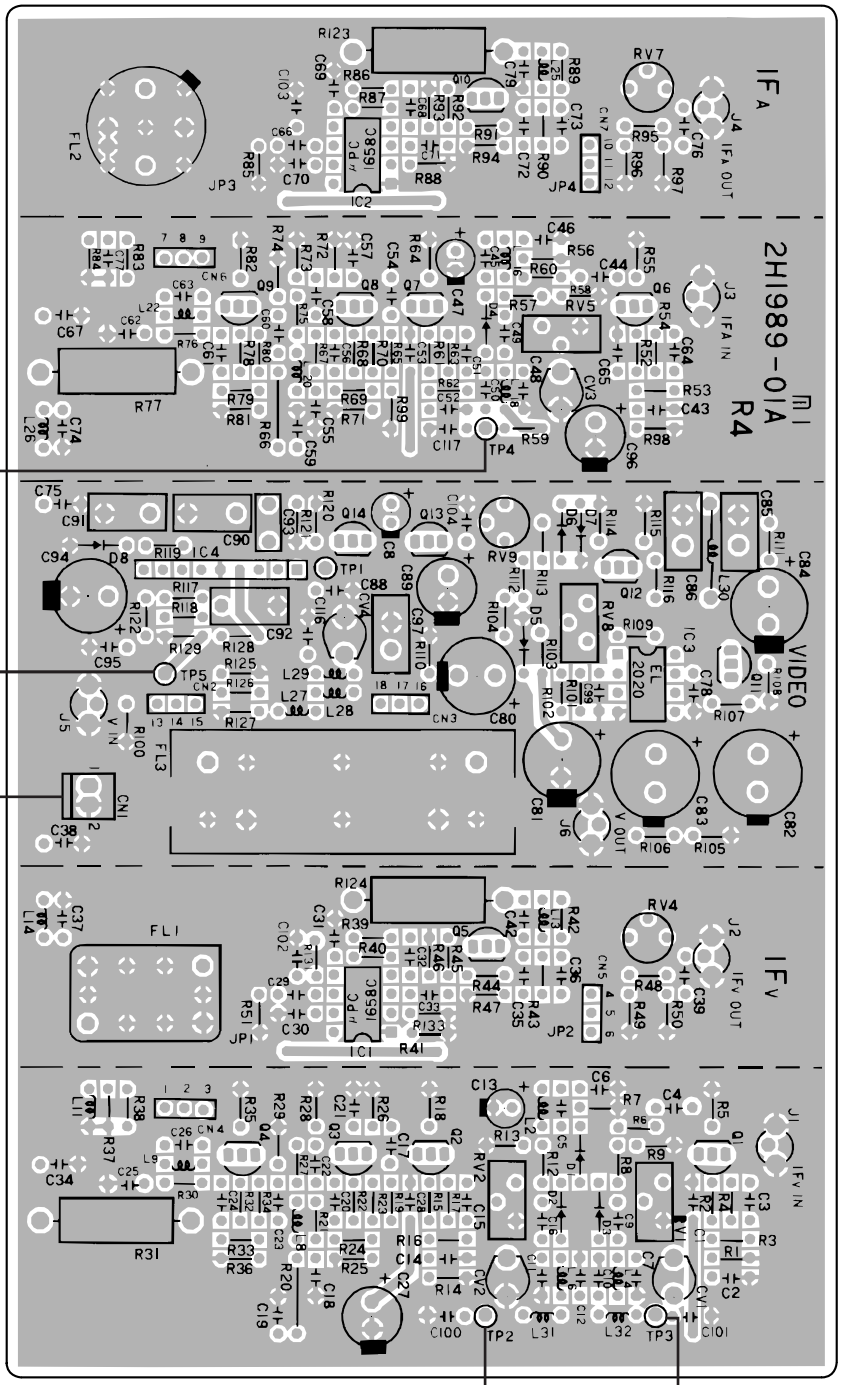
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destinations. For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



AF RF ASSY

SIDE A



A

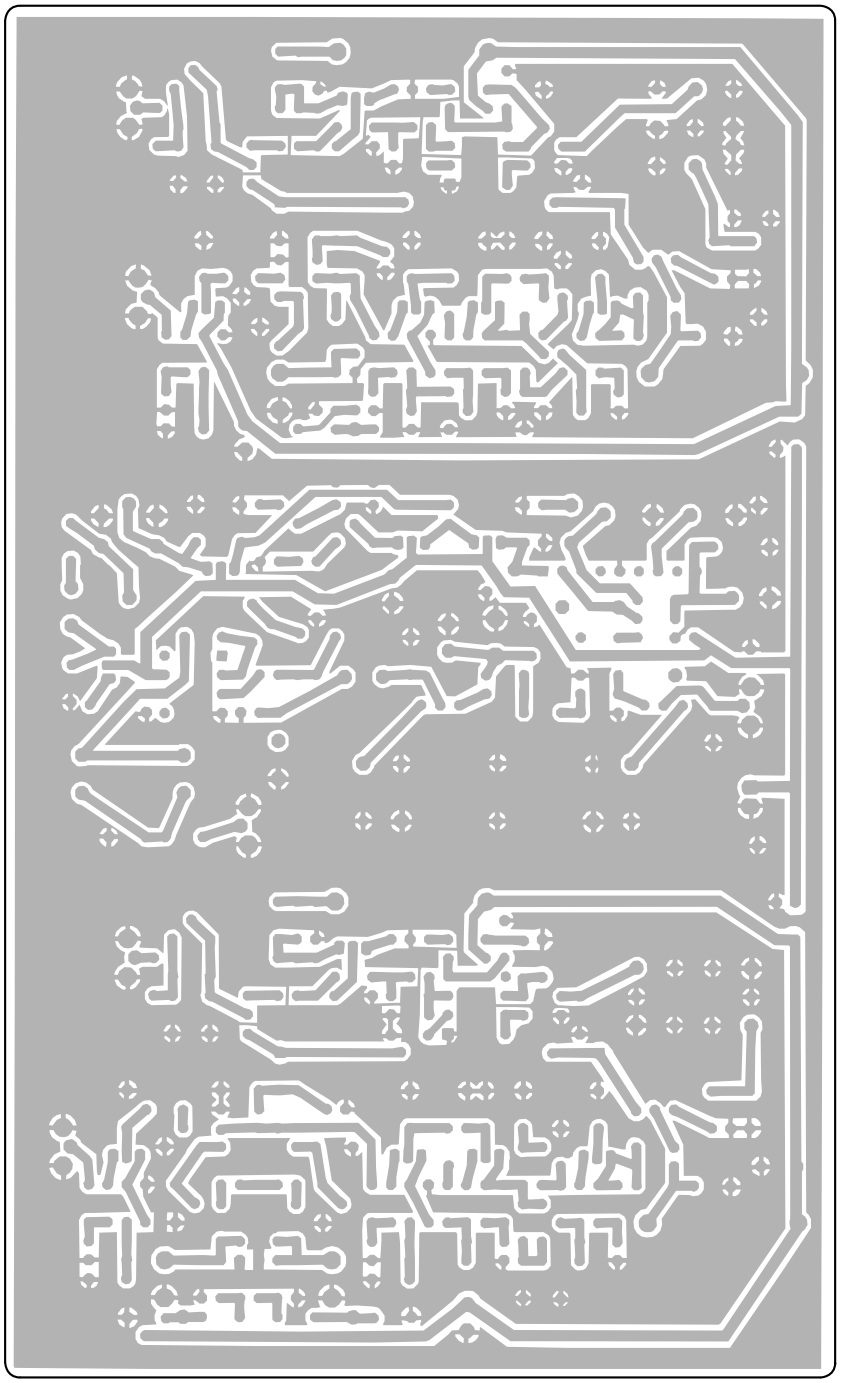
B

C

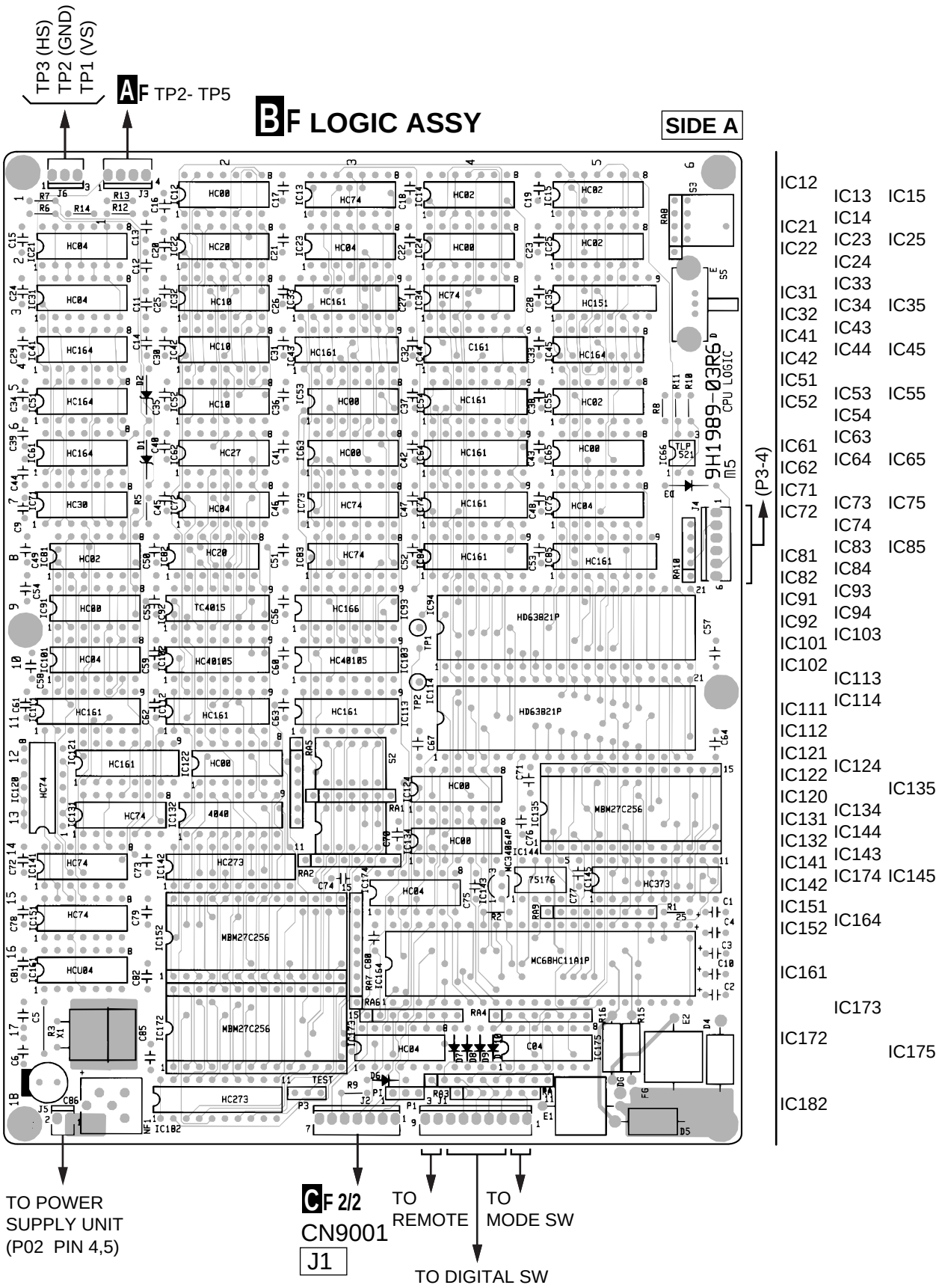
D

AF RF ASSY

SIDE B

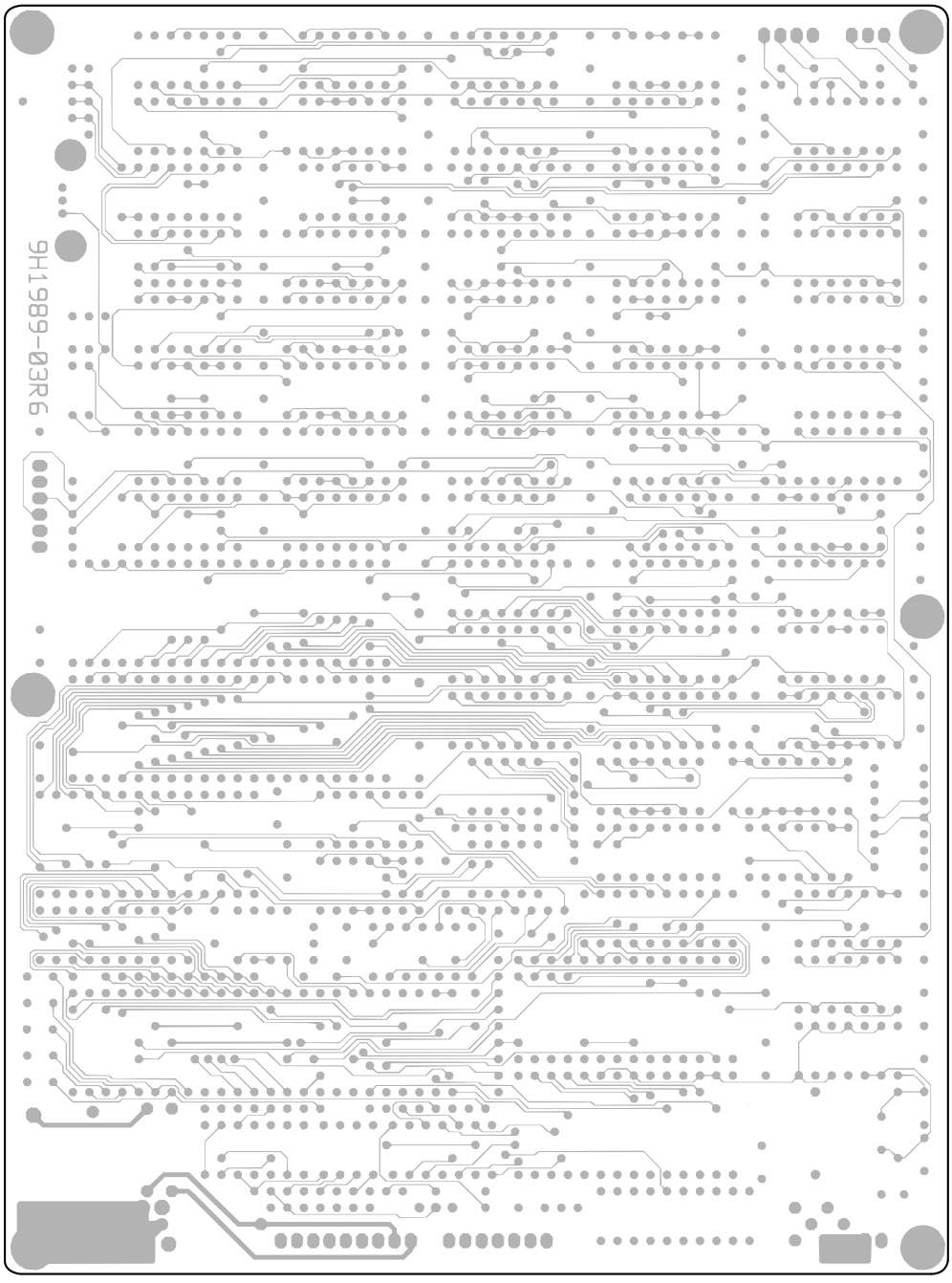


2.2 LOGIC ASSY



BF LOGIC ASSY

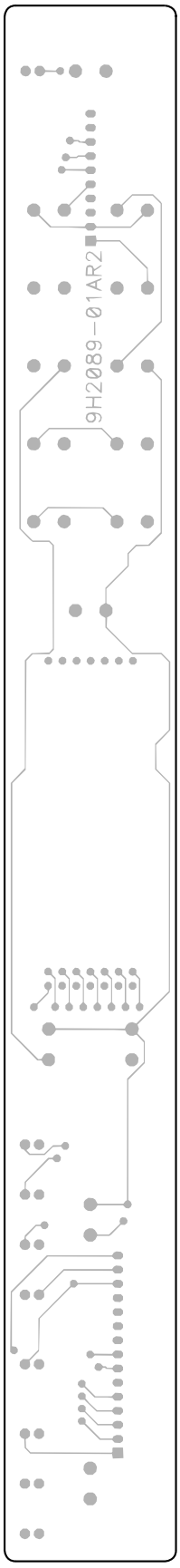
SIDE B



2.3 DISPLAY ASSY

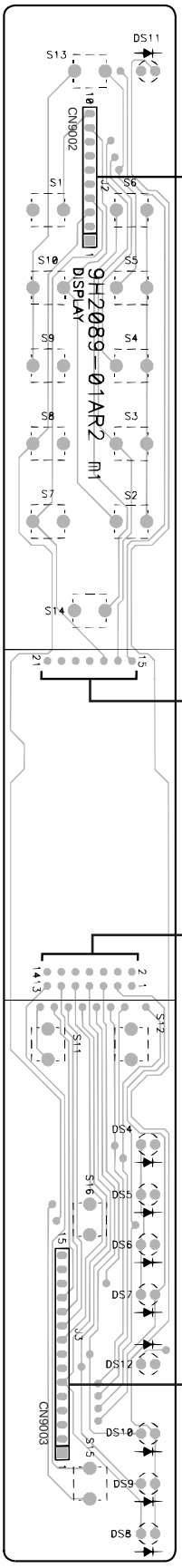
CF 1/2 DISPLAY ASSY (SW BOARD)

SIDE B



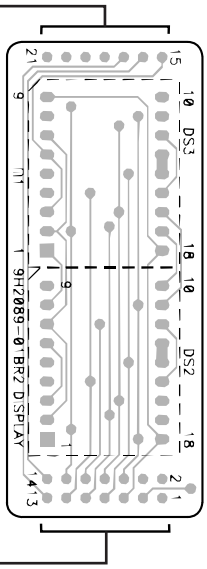
CF 1/2 DISPLAY ASSY (SW BOARD)

SIDE A



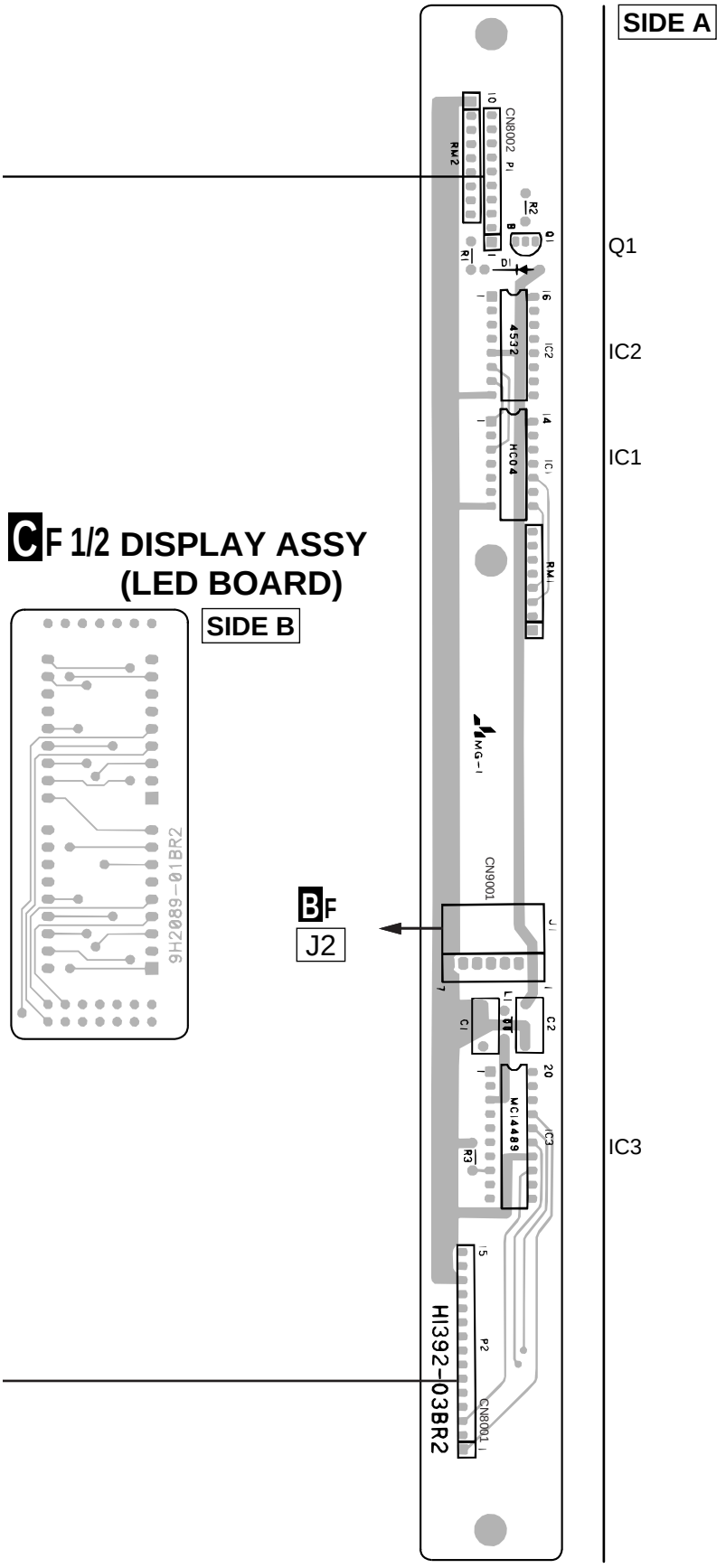
CF 1/2 DISPLAY ASSY (LED BOARD)

SIDE A



CF 2/2 DISPLAY ASSY

SIDE A



CF 2/2 DISPLAY ASSY

SIDE B

CF 1/2 DISPLAY ASSY (LED BOARD)

SIDE B

BF J2

3. PCB PARTS LIST

NOTES: ●*Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
●*The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
●*When ordering resistors, first convert resistance values into code form as shown in the following examples.*
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).
560 Ω → 56×10^1 → 561 ..... RD1/4PU 5 6 1 J
47k Ω → 47×10^3 → 473 ..... RD1/4PU 4 7 3 J
0.5 Ω → R50 ..... RN2H R 5 0 K
1 Ω → 1R0 ..... RS1P 1 R 0 K
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω → 562×10^1 → 5621 ..... RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.

LIST OF ASSEMBLIES

P.C.BOARD ASSEMBLIES

	RF ASSY		BZW1491
	DISPLAY ASSY		BZW1490
	LOGIC ASSY		BZW1489
	POWER SUPPLY UNIT		BZW1252

OTHERS

	IC9135	EP-ROM(PROGRAM)	BZQ1726
	(IC135)	(MBM27C256A-25CZ-1)	
	IC9152	EP-ROM(TIMING1)	BZQ1727
	(IC152)	(27C256A 3110-TMG1)	
	IC9172	EP-ROM(TIMING2)	BZQ1728
	(IC172)	(MBM27C256A-25CZ-2)	
		Terminal (GND) (T-10)	BZK1045
	TP1 - TP3	Terminal (TP) (TJ-10B)	BZK1053
	S2	Digital Switch	BZS1040
	S1	Slide Switch (SSSB-02)	BZS1245
⚠	S3	Power Switch (SDDJA2)	BZS1251
NSP		AC Power Cord	BZD1176

AF RF ASSY

SEMICONDUCTORS

	IC1,IC2	RF AMP(UPC1658A)	BZQ1642
	IC3	Video AMP (EL2020CN)	BZQ1657
	IC4	H-SYNC.DET.	TA7357AP
	D1-D4		1SS110
	D5		RD5.6ESB
	D6,D7		1S953
	D8		RD9.1ESB
	Q1-Q10		2SC3355
	Q11-Q14		2SC1815

COILS AND FILTERS

	L2		LAU1R8K
	L4,L6		LAU47K
	L8,L9,L13,L20,L22,L25		LAU101K
	L11		LAUR33K
	L14,L26	(LAP02KR1R0) (1μH)	BZT1688
	L16,L18		LAU1R5K
	L27,L28		LAU2R2K
	L29		LAU4R7KK
	L30	(LAL03KR-331K) (330μH)	BZT1689
	L31,L32		LAU101K
	F1 (FL1)	SAW Filter(SBF050B)	BZF1028
	F2 (FL2)	SAW Filter (CT04101EA)	BZF1037
	F3 (FL3)	For SCR Video Filter (LP3.75MHZ-2737)	BTF1070

CAPACITORS

	C1,C2,C6,C14,C18,C19,C25,C28	CKCYF103Z50
	C31,C34,C37-C39,C42,C43,C46	CKCYF103Z50
	C52,C53,C55,C59,C62,C65,C67,C69	CKCYF103Z50
	C74,C75,C76,C79,C88,C95,C104	CKCYF103Z50
	C9078	CKCYF103Z50
	C3,C4,C15,C17,C20,C22-C24,C26	CKCYB102K50
	C30,C32,C33,C35,C36,C44,C51	CKCYB102K50
	C54,C56,C58,C60-C64,C66,C68	CKCYB102K50
	C70-C73	CKCYB102K50
	C45	CCCCH100D50
	C77	CCCCH101J50
	C11	CCCCH120J50
	C7	CCCCH150J50
	C116	CCCCH180J50
	C102,C103	CCCCH270J50
	C99	CCCCH470J50
	C21,C57	CCCCH680J50
	C5	CCCCH7R0D50
	C13,C47	CEAS101M10
	C27,C89,C94,C96	CEAS101M25
	C82,C83	CEAS102M10
	C87	CEAS3R3M50
	C80,C81,C84	CEAS471M10
	C9,C16,C49,C50	CQMA102J50
	C92	CQMA104J50
	C117	CQMA392J50
	C100,C101	CQMA472J50
	C93	CQMA473J50
	C10,C12	CQMA562J50
	C97	CQPA241J2A

Mark	No.	Description	Part No.
	C90,C91	(470pF)	BZC2284
	C85,C86	(150pF)	BZC2440
	TC1 (CV1)		ACM-022
	TC2,TC4 (CV2,CV4)		BZC1302
	TC3 (CV3)		BZC1942

RESISTORS

	VR1,VR2,VR5,VR8 (RV1,RV2,RV5,RV8)	(100Ω)	BZC1941
	VR4,VR7 (RV4,RV7)	(1kΩ)	BZC1940
	VR9 (RV9)	(500 Ω)	BZC2432
	R31,R77,R123,R124	(1W,120Ω)	BZC2435
	R85,R103	(360Ω)	BZC2439
	Other Resistors		RD1/4PU□□□J

OTHERS

NSP	CN1001-CN1006 (J1-J6)	Connector (TMP-J01-V6)	BZK1357
NSP	CN1	2P Connector (5045-02A)	BZK1434
NSP	CN2-CN7	Connector (DSP03-003-432G)	BZK1460

BF LOGIC ASSY

SEMICONDUCTORS

	IC12,IC24,IC53,IC63,IC65,IC91		TC74HC00AP
	IC122,IC124,IC134		TC74HC00AP
	IC13,IC34,IC73,IC83,IC120,IC131		TC74HC74AP
	IC141,IC151		TC74HC74AP
	IC14,IC15,IC25,IC55,IC81		TC74HC02AP
	IC21,IC23,IC31,IC72,IC75,IC101		TC74HC04AP
	IC173-175		TC74HC04AP
	IC22,IC82		TC74HC20AP
	IC32,IC42,IC52		TC74HC10AP
	IC33,IC43,IC44,IC54,IC64,IC74		TC74HC161AP
	IC84,IC85,IC111,IC112,IC113,IC121		TC74HC161AP
	IC35		TC74HC151AP
	IC41,IC45,IC51,IC61		TC74HC164AP
	IC62		TC74HC27AP
	IC71		TC74HC30AP
	IC92	(UPD4015BC)	BZQ1652
	IC93		TC74HC166AP
	IC94,IC114	(HD63B21P)	BZQ1387
	IC102,IC103	FIFO Register	TC74HC40105AP
	IC132		TC4040BP
	IC142,IC182		TC74HC273AP
	IC143	System Riset	MC34064P
	IC144		SN75176BP
	IC145		TC74HC373AP
	IC161		TC74HCU04AP
	IC164	(MC68HC11A1P)	BZQ1385
	IC66	Photo Coupler	TLP521-1
	D1,D2		RD5.6EB
	D3	(1SR35-400A)	BZQ1467
	D4,D5	(CP2012)	BZQ1643
	D6-D10		RD6.2ESB
	D9001,D9002	(RAV-091L)	BZQ1644

Mark	No.	Description	Part No.

SWITCHES

	S1,S2	Dip Switch (DSS8-05)	BZS1042
	S3	Rotary Switch (DRS3116)	BZS1180
	S5	Slide Switch (SSSY-1-2)	BZS1255

FILTERS

	NF1	Power Line Filter (BNX002-01)	BZF1031

CAPACITORS

	C1-C4,C10		CQMA103J50
	C5,C6		CCCCH220J50
	C86		CEAS101M10
	C11 - C13		CKCYB102K50
	C15-C64,C67-C85		CKCYF103Z50
	C9	(CQMA222J50)	BZC2442

RESISTORS

	R15,R16		RD1/2LMF220J
	R9001,R9003,R9005 Resistor Array (M7-1-103J)		BZC2434
	R9002,R9004,R9006 Radder Resistor (RKM8LW102F)		BZC1943
	R9007	Resistor Array (M9-1-472J)	BZC2232
	R9008	Resistor Array (M05-1-R4.7K)	BZC1703
	R9009	Radder Resistor (M9-1-103)	BZC2262
	R9010	Resistor Array (M5-1-103J)	BZC2433
	Other Resisters		RD1/4PU□□□J

OTHERS

	9001,9003	Socket Pin(PM-1)	BZK1287
	9002,9004	Jumper Pin (JX-1)	BZK1288
	X1	Crystal Resonator (16.11189MHz)	BZS1256
NSP	IC Socket (XR2A-2811)(28P)		BZK1002
NSP	CN1	9P Connector (5045-09A)	BZK1389
NSP	CN2	Connector (5045-7P)	BZK1282
NSP	CN3	4P Connector (5045-04A)	BZK1447
NSP	CN4	6P Connector (5045-06A)	BZK1448
NSP	CN5	2P Connector (5045-02A)	BZK1434
NSP	CN6	3P Connector (5045-03A)	BZK1446

CF DISPLAY ASSY

SEMICONDUCTOR

	IC1		TC74HC04AP
	IC2	(UPD4532BC)	BZQ1648
	IC3	(MC14489P)	BZQ1390
	Q1		2SA733
	D1		1S1588
	D2,D3 (DS2,DS3)	(TLR324) LED Display	BZQ1164
	D4-D11 (DS4-DS11)	LED (GL3PG8)	BZQ1388
	D12 (DS12)	LED (GL3PR8)	BZQ1389

Mark	No.	Description	Part No.
SWITCH			
	S1-S16	Key Switch (SKEGAD)	BZS1335
COILS			
	L1		LAU4R7K
CAPACITORS			
	C1,C2		CQMA103J50
	C4		CKCYF103Z50
RESISTORS			
	R7001	Radder Resistor (RKM8LW102F)	BZC1943
	R7002	Radder Resistor (M9-1-103J)	BZC2262
	R1		RD1/4PU471J
	R2		RD1/4PU222J
	R3		RD1/4PU102J
OTHERS			
		Key Top (6AVAA0163A)	BZS1336
NSP	CN8001	Pin (PIC-MSA-15P-2G)	BZK1286
NSP	CN8002	Pin (PIC-MSA-10P-2G)	BZK1285
NSP	CN9001	Connector (5045-7P)	BZK1282
NSP	CN9002	Socket (PIC-FS-10P-G)	BZK1283
NSP	CN9003	Socket (PIC-FS-15P-G)	BZK1284

POWER SUPPLY UNIT

POWER SUPPLY UNIT has no service part.

4. ADJUSTMENT

Note 1 : Perform this adjustment more than 30 minutes after power ON.

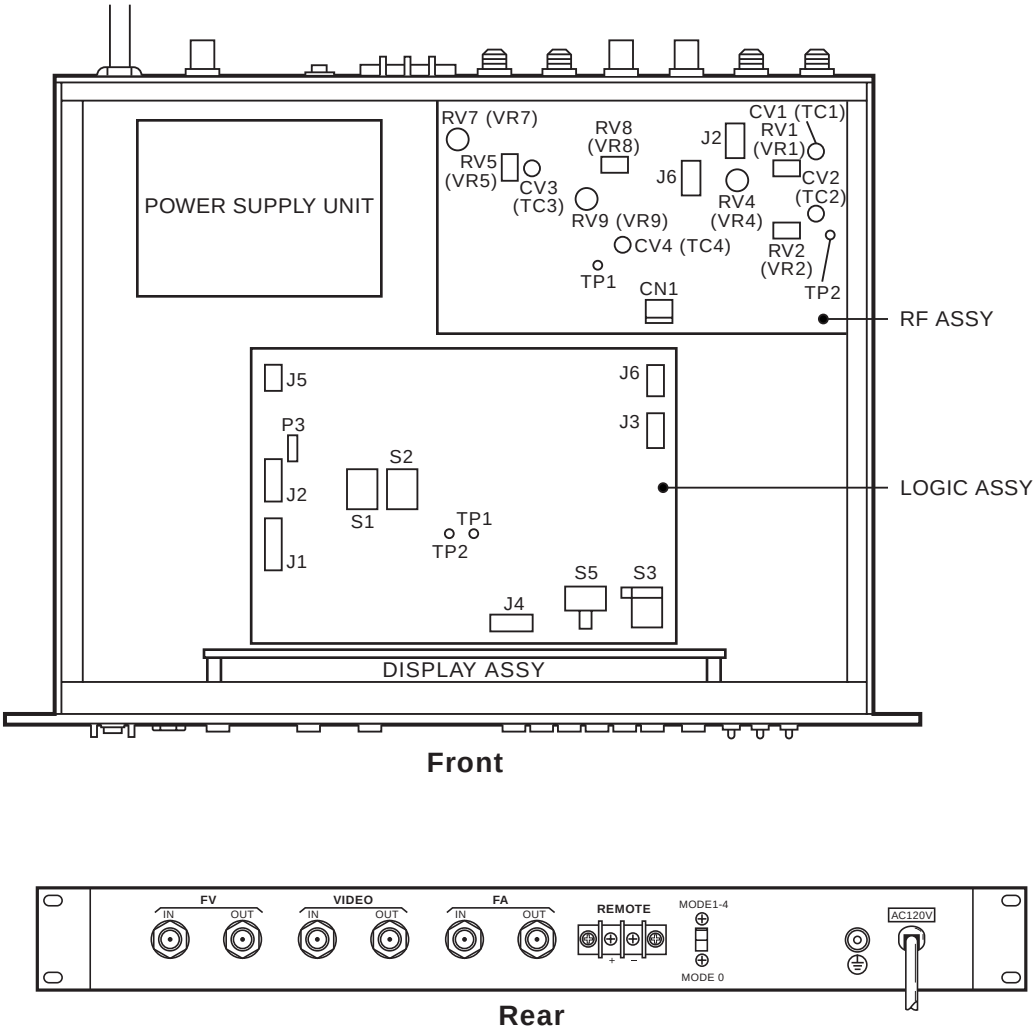


Fig. 4-1 Locations of parts for alignment

4.1 Devices Used

1. Spectrum analyzer (Equivalent to Advantest R3265A)
2. Oscilloscope (Equivalent to IWATSU SS-5711)
3. Digital voltmeter (one which can display more than 2 decimal places)
4. Video SG (Equivalent to SHIBASOKU TG7/1)
5. Variable resistance attenuator (Equivalent to ANRITSU MN510D)
6. Audio analyzer (Equivalent to HP 8903B)
7. TV modulator (Equivalent to EIDEN TV IF MOD 115K + UP CONV 115K)
8. CATV terminal (Equivalent to PIONEER BA-6300)
9. TV demodulator (Equivalent to EIDEN 463B-B)
10. CW generator (One which can output 100.15 MHz, 60 dBmV/ 75 Ω)
11. BTSC audio multiplexing modulator (Equivalent to EIDEN 465Z series)
12. BTSC audio multiplexing demodulator (Equivalent to EIDEN 466B)
13. VHF amplifier (Equivalent to EIDEN 801C)

Video System

Note 2 : If the time axis on the oscilloscope screen deviates or to move to a clearer position on the screen, adjust finely using Delay. However, do not change the vertical axis and horizontal axis ranges.

Note 3 : When reading the waveform on the oscilloscope screen, read the center of the waveform noise.

Note 4 : If the oscilloscope signal waveform is difficult to read, adjust the luminance.

4.2 Adjusting the Clamp Voltage

1. Connect the digital voltmeter to TP1 of the RF ASSY as shown in Connection Diagram 1.
2. Adjust control VR9 (RV9) of the RF ASSY so that the voltage value on the digital voltmeter becomes within DC+2.7 to 2.9V.

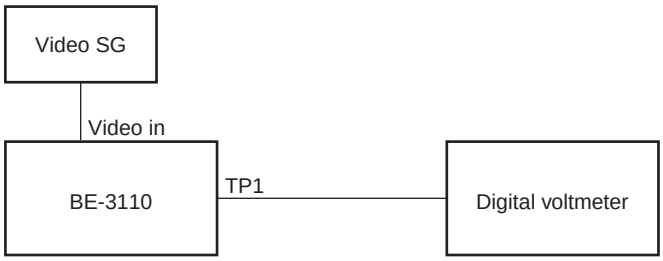


Fig. 4-2 Connection Diagram 1

4.3 Adjusting the Video Output

1. Connect the devices as shown by the dotted in Connection Diagram 2.
2. Set the devices as follows.
   - Oscilloscope 0.1 V/div
     5 µs/div
     H-SYNC TRG.
   - Video SG All white signal (1 Vp-p/75Ω)
3. Adjust the oscilloscope using the VARIABLE level knob, etc. so that the p-p value of the signal is at the 6th mark on the oscilloscope screen. (Refer to the video adjustment waveform diagram in Fig. 4-4.)
4. Connect the devices as shown by the solid line in Connection Diagram 2.
5. Adjust control VR8 (RV8) of the RF ASSY so that the p-p value (within 0.97 to 1.03 Vp-p) set in step 3 is obtained.

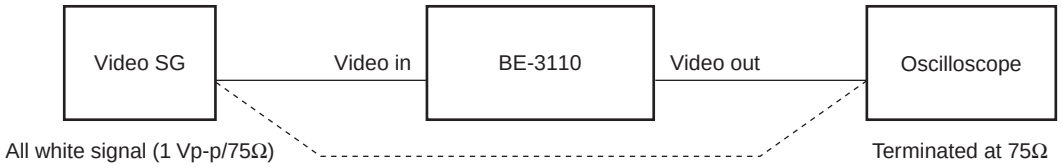


Fig. 4-3 Connection Diagram 2

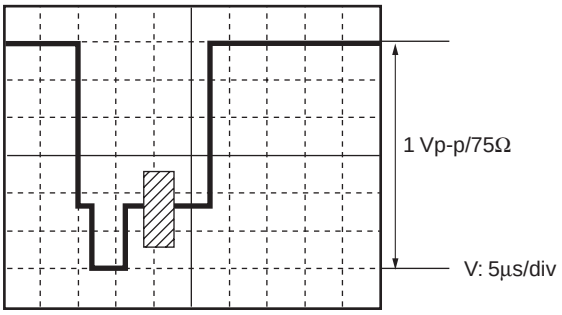


Fig. 4-4 Video Adjustment Waveform Diagram

IF System

Note 5 : Adjust the RF ATT of the spectrum analyzer so that the spectrum analyzer does not distort.

Note 6 : When reading waveform on the screen of the spectrum analyzer, read the center of the waveform noise.

Note 7 : If the waveform on the screen of the spectrum analyzer is difficult to read, adjust the luminance.

4.4 Adjusting the IFv Output Level

1. Connect the devices as shown by the dotted in Connection Diagram 3.
2. Set the devices as follows.
   - Spectrum analyzer — 1 dB/div, f_0 : 45.75 MHz, Video Filter: off
   - BE-3110 — Standby
   - Video SG — Random
   - TV modulator — IFv: 45.75 MHz/50 dBmV, unmodulated
3. Adjust the spectrum analyzer so that the waveform of the IFv signal peak level of the TV modulator can be seen clearly on the screen of the spectrum analyzer. (Use this item as the reference level.)
4. Connect the devices as shown by the solid line in Connection Diagram 3.
5. Set this unit to standby.
6. Adjust control VR4 (RV4) of the RF ASSY so that the waveform comes to the position set at step 3. (Within 0 dB ± 0.2 dB)

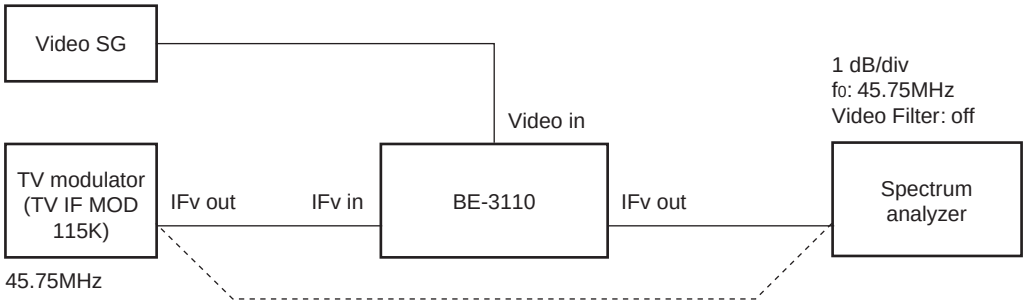


Fig. 4-5 Connection Diagram 3

4.5 Adjusting the IFa Output Level

1. Connect the devices as shown by the dotted in Connection Diagram 4.
2. Set the devices as shown below.
   - Spectrum analyzer — 1 dB/div, f_0 : 41.25 MHz
   - BE-3110 — Standby
   - Video SG — Random
   - TV modulator — IFa: 41.25 MHz/45 dBmV, unmodulated
3. Adjust the spectrum analyzer so that the waveform of the IFa signal peak level of the TV modulator can be seen clearly on the screen of the spectrum analyzer. (Use this item as the reference level.)
4. Connect the devices as shown by the solid line in Connection Diagram 4.
5. Set this unit to standby.
6. Adjust control VR7 (RV7) of the RF ASSY so that the waveform comes to the position set at step 3. (Within 0 dB ± 0.2 dB)

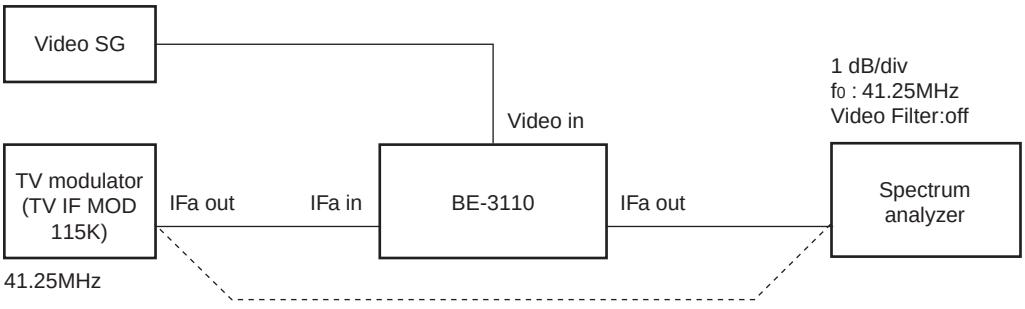


Fig. 4-6 Connection Diagram 4

4.6 Adjusting the Scramble Timing

1. Connect the devices as shown in Connection Diagram 5.
2. Set the devices as shown below.
   - Video SG — All black signals
   - TV modulator — IFv: 45.75 MHz/50 dBmV; IFa: 41.25 MHz/45 dBmV
   - Oscilloscope — H: 1 µs/div; V: 0.1 V/div
   - CATV terminal — US-7ch/10 dBmV input
   - Variable resistance attenuator — Adjust the output level to 10 dBmV
3. Set this unit to the adjustment (Digitally SW:F) mode.
4. Set to the group 0 mode 1 using the key switch on the front panel of this unit, and adjust so that the return waveform of the video signal in the timing waveform (Fig. 4-7) shown on the oscilloscope screen comes to point ①.
5. Set to the group 0 mode 2 using the key switch on the front panel of this unit, and adjust so that the compressed waveform of the video signal in the timing waveform shown on the oscilloscope screen comes to point ②.

Note 8 : Steps 4, and 5 can be performed in any order.

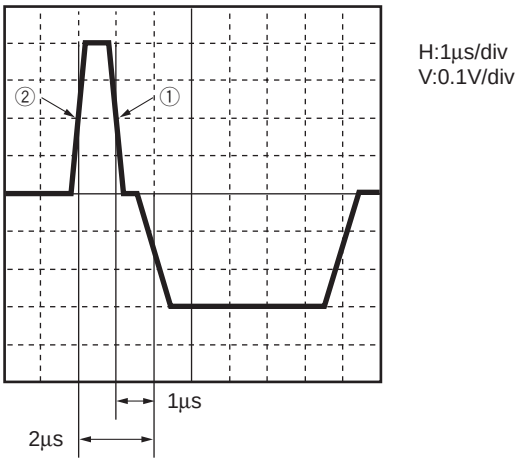


Fig. 4-7 Timing Waveform

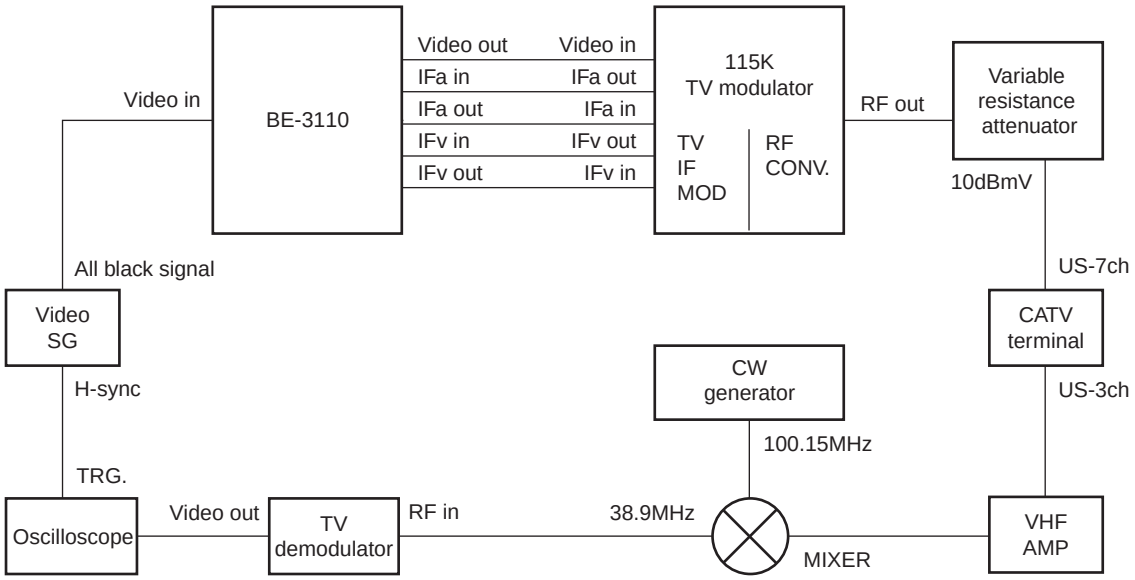


Fig. 4-8 Connection Diagram 5

4.7 Adjusting the Modulation Rate and Modulation Distortion of the IFa Key (Refer to Fig. 4-11 adjustment waveform diagram 1)

Note 9 : Be sure to adjust according to the following order.

1. Connect the devices as shown in Connection Diagram 6.
2. Set the devices as follows.
   - Audio analyzer 1 kHz
   - CATV terminal US-7ch/10 dBmV input
   - TV modulator Fa: Adjust to ± 25 kHz
     Fv: Modulation rate 87.5%
     IFa: 41.25 MHz/45 dBmV
     IFv: 45.75 MHz/50 dBmV
   - Variable resistance attenuator
     Adjust the output level to 10 dBmV
   - Video SG Staircase wave
   - BE-3110 Clear mode (Digitally SW: 0)
   - CW generator 100.15 MHz/60 dBmV/75Ω
3. Observe the S/N ratio using the audio analyzer.
4. Adjust the trimmer capacitor TC3 (CV3) of the RF ASSY so that the value in step 3 becomes optimum.
5. Connect the devices as shown in Connection Diagram 7, and set the devices as follows.
   - Spectrum analyzer 0.2 dB/div
     VBW: 1 MHz/RBW: 1 MHz
     SPAN: 1 MHz
     SWEEP TIME: 200 ms
     f_0: TV modulator Fa output frequency
   - Variable resistance attenuator
     5.5 dB
6. Disconnect the cables connected to IFv in and IFv out of the unit.
7. Adjust the spectrum analyzer so that the key modulation peak level can be seen clearly on the spectrum analyzer screen. Do not modulate the audio FM. (Use this item as the reference level.)
8. Set the variable resistance attenuator to 0 dB.
9. Adjust control VR5 (RV5) of the RF ASSY so that the bottom level in the key modulation of the signal comes to the position set in step 7.
10. Repeat the adjustment in steps 1 to 9 three times to raise the accuracy.

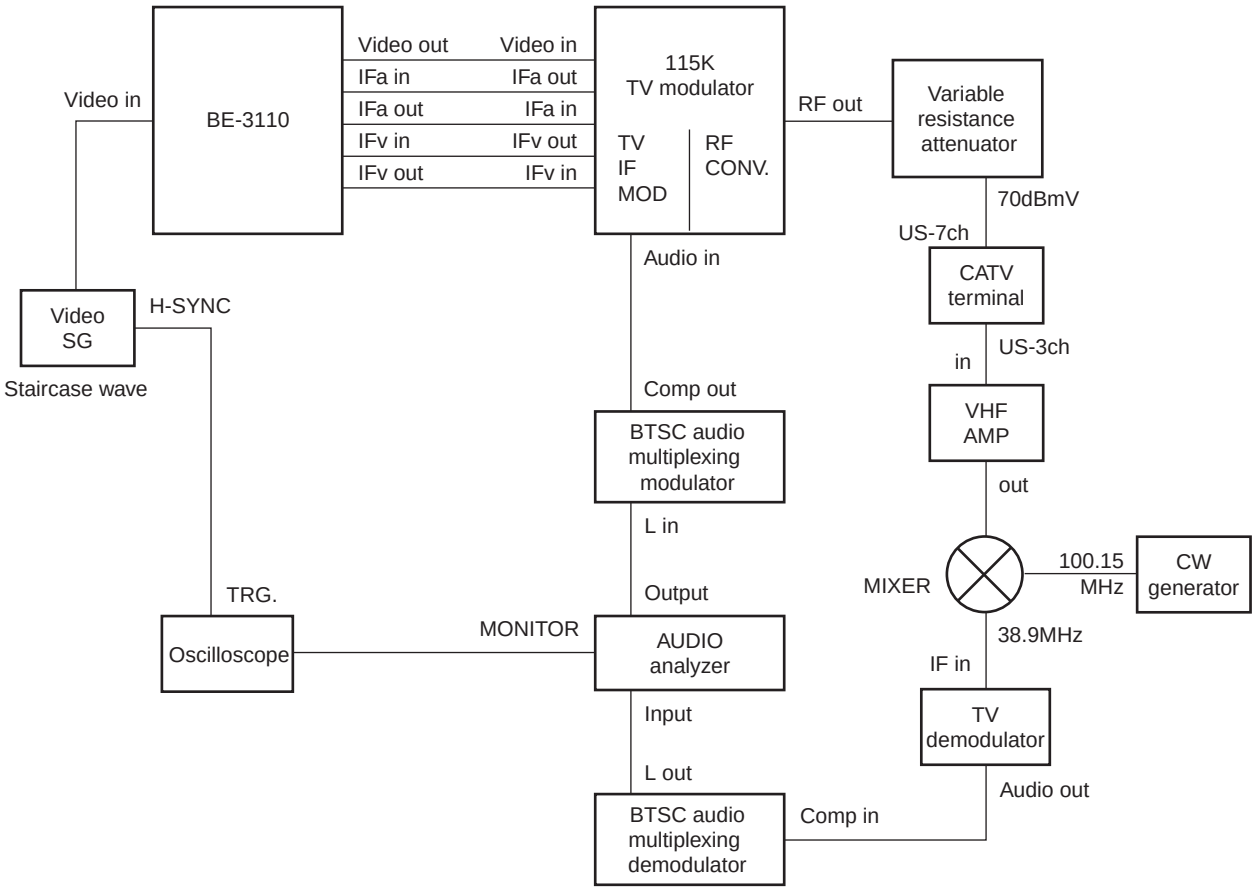


Fig. 4-9 Connection Diagram 6

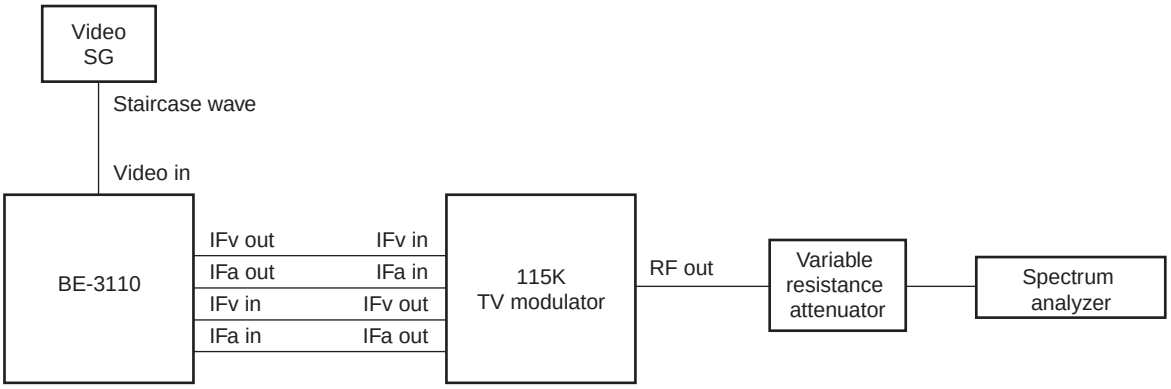


Fig. 4-10 Connection Diagram 7

4.8 Adjusting the Compression Rate and Compression Distortion of the IFv (Refer to Fig. 4-11 adjustment waveform diagram 1)

Note 10 : Be sure to adjust according to the following order.
Note 11 : As there are two modes for the compression rate;6 dB and 10 dB, adjust in each mode.

1. Connect the devices as shown in Connection Diagram 6.
2. Set the devices as follows.
   - Audio analyzer 1 kHz
   - CATV terminal US-7ch/10 dBmV input
   - TV modulator Fa: Adjust to ± 25 kHz
     Fv: Modulation rate 87.5%
     IFa: 41.25 MHz/45 dBmV
     IFv: 45.75 MHz/50 dBmV
   - Variable resistance attenuator
     Adjust the output level to 10 dBmV
   - Video SG Staircase wave
   - CW generator 100.15 MHz/60 dBmV/75Ω
3. Tune the CATV terminal, and set this unit to the 6 dB mode.
4. Observe the S/N ratio using the audio analyzer.
5. Adjust the trimmer capacitor TC2 (CV2) of the RF ASSY so that the value in step 4 becomes optimum.
6. Connect the devices as shown in Connection Diagram 7, and set the devices as follows.
   - Spectrum analyzer 0.2 dB/div
     VBW: 1 MHz/RBW: 1 MHz
     SPAN: 1 MHz
     SWEEP TIME: 200 ms
     f_0 : TV modulator Fv output frequency
   - Variable resistance attenuator
     6 dB
7. Disconnect the cables connected to IFa in and IFa out of the unit.
8. Adjust the spectrum analyzer so that the compression modulation peak level can be seen clearly on the spectrum analyzer screen. (Use this item as the reference level.)
9. Set the variable resistance attenuator to 0 dB.
10. Adjust control VR2 (RV2) of the RF ASSY so that the bottom level in the compression modulation of the signal comes to the position set in step 7.
11. Connect the devices as shown in Connection Diagram 6.
12. Set the devices as follows.
    - Audio analyzer 1 kHz
    - CATV terminal US-7ch/10 dBmV input
    - TV modulator Fa: Adjust to ± 25 kHz
      Fv: Modulation rate 87.5%
      IFa: 41.25 MHz/45 dBmV
      IFv: 45.75 MHz/50 dBmV
    - Variable resistance attenuator
      Adjust the output level to 10 dBmV
    - Video SG Staircase wave
    - CW generator 100.15 MHz/60 dBmV/75Ω
13. Tune the CATV terminal, and set this unit to the 10 dB mode.
14. Observe the S/N ratio using the audio analyzer.
15. Adjust the trimmer capacitor TC1 (CV1) of the RF ASSY so that the value in step 4 becomes optimum.
16. Connect the devices as shown in Connection Diagram 7, and set the devices as follows.
    - Spectrum analyzer 0.2 dB/div
      VBW: 1 MHz/RBW: 1 MHz
      SPAN: 1 MHz
      SWEEP TIME: 200 ms
      f_0 : TV modulator Fv output frequency
    - Variable resistance attenuator
      10 dB

17. Disconnect the cables connected to IFa in and IFa out of the unit.
18. Adjust the spectrum analyzer so that the compression modulation peak level can be seen clearly on the spectrum analyzer screen. (Use this item as the reference level.)
19. Set the variable resistance attenuator to 0 dB.
20. Adjust control VR1 (RV1) of the RF ASSY so that the bottom level in the compression modulation of the signal comes to the position set in step 7.
21. Repeat the adjustments in section 4.6 and the adjustments in steps 1 to 20 in section 4.8 three times to raise the accuracy.

*1 Observe the following values when adjusting the modulation distortion and compression distortion to facilitate the adjustments.
- Clear mode: Meter reading
- 6/10 dB mode: Noise waveform on oscilloscope

[Adjustment waveform diagram 1] : [Example of Key Modulation Rate (5.5 dB)]

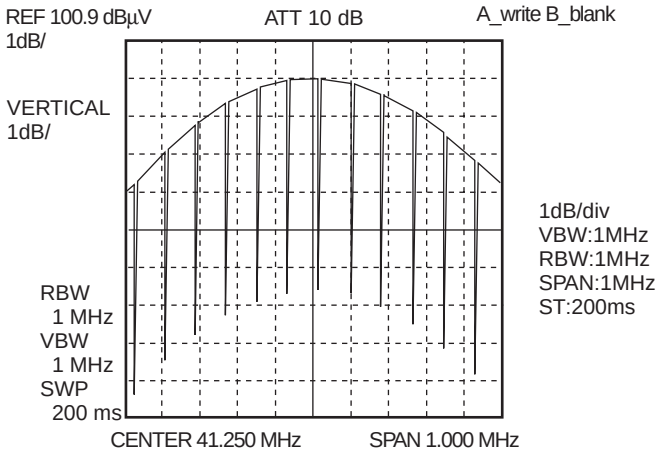


Fig. 4-11 Adjustment Waveform Diagram 1

*2 The above shows one example of the adjustment waveform. Be sure to adjust using the attenuator substitution method. Do not perform adjustment on the screen.

4.9 Setting the Switches of the LOGIC Assy

Switch No.	
S1	ALL OFF
S2	ALL OFF
S3	0
S4	NA
S5	D

Jumper No.	
P1	DE side
P3	Not TEST side

Set switches as shown above.